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**SPORADIC GROWTH OF CERTAIN DIATOMS
AND THE RELATION THEREOF TO
IMPURITIES IN THE WATER-
SUPPLY OF CITIES.**

By J. D. HYATT, F. R. M. S., Morrisania, N. Y.

Collectors of diatoms who have visited the same localities for several years in succession, have no doubt observed the changes in the orders, genera and species of these plants, which take place with the varying conditions of temperature, etc., through the successive months of the year.

It may not, however, have been so commonly noticed that while some species maintain a very permanent foothold, and are uniformly found under similar conditions at the same seasons every year, there are others that appear to be sporadic, or epidemic in their habits, and after suddenly making their appearance in great profusion in places where they were before unknown, disappear quite as suddenly as they came, reappearing after long intervals. This is more particularly the case in restricted areas, subject, of course, to greatly-varying local conditions.

One instance, however, that came under my notice, seems to be exceptional, and that was the growth in abundance of *Stauroneis phænicenteron* in a small pool fed by a perennial spring having a very uniform temperature of 54° throughout the year, and so situated as not to be affected by either floods or drought.

In the month of March, 1875, *Stauroneis* flourished in this pool in the greatest luxuriance, but has not been found living there since.

In the month of August, 1880, a small tide pool of perhaps a half acre in extent, which I had examined almost daily for some time, suddenly presented an enormous growth of *Pleurosigma formosum*. On a still day, under a burning August sun, the surface of the water, as the tide rose, was for the depth of nearly a quarter of an inch literally thick with the frustules, which being in a vigorous state of growth, and filled with the rich brown endochrome, presented a very beautiful appearance.

Since that time I have not been able to detect any excess of that species, although the conditions remain the same. This pool continues to produce *Pleurosigma* almost exclusively, but the species *Balticum*, *formosum*, *fasciola*, and *angulatum* are about equally represented.

I mention these as characteristic cases among a considerable number that have come under my notice, but an instance of this sporadic growth of a particular species that occurred in the spring of 1881, was in results a matter of more serious import than the singular case already mentioned.

For about three weeks following the 20th of March of that year, the upland brooks and streams on the east of the Hudson were filled to an extraordinary extent with a growth of *Meridion circulare*. This diatom, which, as is well known, grows in a gelatinous envelope, covered at that time every submerged object in these streams, to the depth of nearly a quarter of an inch, for many miles of their course. The growth continued until about the 10th of April, when they began to break loose, and by the 15th had almost entirely disappeared.

About the 20th of April the Croton water delivered in New York City began to be pervaded by an extremely unpleasant odor, suggestive of bilge water, caused no doubt by the decomposition of the gelatinous envelope of *Meridion*. This unpalatable flavor to the Croton, at a season of the year when the water is usually most abundant and free from all offensive odors, was the cause of much complaint and no small alarm among the citizens. The city authorities employed a corps of chemical and microscopical experts to

examine the water, who reported that the Croton contained no unusual amount of organic matter and nothing deleterious to health.

The offensive odor continued about two weeks, and was in all respects exactly similar to that of the decomposing specimens contained in my collecting bottles; and from some experiments in diluting the same, it was quite surprising to observe how small a quantity of the fetid gelatinous matter was sufficient to taint a very large volume of water.

It is worthy of note that a careful examination of the brooks in which *Meridion circulare* flourished in the spring of 1881, failed to reveal a single living specimen in 1882.

Respecting the cause of these diatomaceous epidemics, I have at present no explanation and no theory to offer, but as the subject has an important sanitary bearing on the water-supply of cities, I think it a matter worthy the attention of microscopists.